

WHAT IS CLAIMED IS:

1. A cluster system comprising:

a plurality of computers;

a data storage device;

5 a cluster file system providing exclusive control for maintaining data consistency by using a lock function in order to offer shared access to a file recorded on the data storage device from a process operating on the plurality of computers;

10 cluster shared memory map means for allocating an area for shared memory in an address space of the process and for mapping data of files managed by the cluster file system in the area; and

15 cluster shared memory lock allocation means for allocating the lock function of the cluster file system to the shared memory and enabling exclusive control for maintaining data consistency on the shared memory.

2. The cluster system according to claim 1, further comprising:

20 access inhibit setting means for inhibiting an access to all pages in the allocated shared memory;

data write means, when accessing the access-inhibited page causes a read page fault, for reading the data mapped to the page from the file recorded on the data storage device and writing the read data; and

25 setting means for read-enabling the page where the data is written to be readable.

0944097.090404
FOI050 46044660

5

5

5

10

15

15

20

25

computers to a file recorded in the data storage device,
the method comprising the steps of:

allocating an area for shared memory in an address
space of the process and mapping data of files managed
5 by the cluster file system in the area; and

allocating the lock function of the cluster file
system to the shared memory and enabling exclusive
control for maintaining data consistency on the shared
memory.

10 6. The memory access control method according to
claim 5, further comprising the steps of:

inhibiting an access to all pages in the allocated
shared memory;

15 when accessing the access-inhibited page causes a
read page fault, reading the data mapped to the page
from the file recorded on the data storage device and
writing the read data; and

read-enabling the page where the data is written
to be readable.

20 7. The memory access control method according to
claim 5, further comprising the steps of:

inhibiting access to all pages in the allocated
shared memory;

25 when accessing the access-inhibited page causes a
write page fault, reading the data mapped to the page
from the file recorded on the data storage device and
writing the read data; and

09944097.090404
T04060-2604460

read/write-enabling the page where the data is written.

8. The memory access control method according to claim 7, further comprising the steps of:

5 acquiring a lock, when the cluster shared memory is locked, by access-inhibiting a page in a cluster shared memory area where a file managed by the cluster file system is mapped in the address space for the process; and

10 writing data of an updated page in the cluster shared memory area back to a file managed by the cluster file system when the acquired lock is unlocked.

15 / 9. A recording medium storing computer-executable program code for memory access control in a cluster system having a plurality of computers, a data storage device, and a cluster file system providing exclusive control for maintaining data consistency by means of a lock function in order to allow shared access from a process operating on the plurality of computers to a
20 file recorded in the data storage device, the program code comprising:

25 means for causing a computer to allocate an area for shared memory in an address space for the process and map data of a file managed by the cluster file system to the area; and

 means for causing a computer to allocate the lock function of the cluster file system to the shared

0944097-09401
T04060-26044660

memory and enable exclusive control for maintaining data consistency on the shared memory.

10. The recording medium according to claim 9, wherein the program code further comprises:

5 means for causing a computer to inhibit access to all pages in the allocated shared memory;

means for causing, when accessing the access-inhibited page causes a read page fault, a computer to read the data mapped to the page from the file recorded on the data storage device and write the read data; and

10 means for causing a computer to read-enable the page where the data is written to be readable.

11. The recording medium according to claim 9, wherein the program code further comprises:

15 means for causing a computer to inhibit access to all pages in the allocated shared memory;

means for causing, when accessing the access-inhibited page causes a write page fault, a computer to read the data mapped to the page from the file recorded on the data storage device and write the read data; and

20 means for causing a computer to read/write-enable the page where the data is written.

12. The recording medium according to claim 11, wherein the program code further comprises:

25 means for causing a computer to acquire a lock, when the cluster shared memory is locked, by access-inhibiting a page in a cluster shared memory area where

0944097-050401

a file managed by the cluster file system is mapped in the address space for the process; and

means for causing a computer to write data of an updated page in the cluster shared memory area back to
5 a file managed by the cluster file system when the acquired lock is unlocked.

09944097-050401
FD-1050-26044660